

Remarks and Arguments

Reconsideration is respectfully requested.

Claims 1, 3, 8, and 21-26 are pending in the present application before this amendment. By the present amendment, claims 21, 23 and 25 are canceled without prejudice; claims 1, 3, and 8 are amended. No new matter has been added.

In the office action (page 2), claims 1, 3 and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 2004/0048591 (Kim) in view of U.S. Publication No. 2003/0119467 (Wellend). Also in the office action (page 4), claims 21, 23 and 25 are indicated as allowable if rewritten in independent form.

The applicants respectfully traverse this rejection and submit that the claims, as they now stand, are in condition for allowance.

The Examiner points out that since Wallend, related to a frequency synthesizer, already teaches the advantage of a resonator being controlled by the analog control signal and the digital control signal, the present invention can be easily invented by a person of ordinary skill in the art from Kim and Wallend combined.

However, the reason the resonator is used that is digitally and analogly controlled in the frequency synthesizer in Wallend is completely different from the reason the resonator that is digitally controlled in the "signal processing block" in the present invention. Therefore, it would be difficult for a person of ordinary skill in the art to easily invent the present invention or derive the reason for using the digital control resonator in the signal processing block, even from Kim and Wallend combined.

Generally, the reason why the resonator that is digitally controlled in the oscillator of the frequency synthesizer is as follows. As for Varactor, a variable capacitor, that is used much in the resonator, it may be difficult to obtain a wide frequency variable scope in a high operation frequency, since the capacitance of a fixed value that is parasitic

increases as the variable scope widens. In order to solve this problem, the MIM (metal-insulator-metal) capacitor is used. However, as for the MIM capacitor, unlike Varactor, the capacitance does not change by continuous voltage. Therefore, the MIM capacitor operates as it is digitally turned ON/OFF, and the parasitic capacitance is very small. Therefore, in the event the MIM capacitor and Varactor are used together, the MIM capacitor is used for coarse tuning and Varactor is used in fine final tuning. This way, a wide tuning range may be achieved. In particular, since Varactor is used only in final fine tuning, the size of Varactor is small, and as such, the variable voltage contrast capacitance change rate is small. Also, the VCO gain (which is equal to frequency tuning range divided by control voltage range) can be reduced. As a result, it reduces the noise coming from the input of the frequency synthesizer that operates on feedback and coming out through the VCO output. That is, the reason why the resonator that is digitally controlled in the frequency synthesizer in Wallend does not have anything to do with linearity of the signal that the present invention seeks to improve.

The present invention, using the resonator that is digitally controlled in the signal processing block and controlling the resonator using the control signal of the frequency synthesizer that controls the resonating frequency of the oscillator, prevents the harmonic distortion damage to the linearity of the signal as the capacitance of Varactor changes by the control signal and input signal of the receiver. Such characteristic of the present invention is explained in detail in the remarks submitted on July 9, 2010.

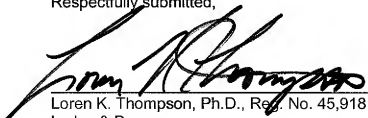
Therefore the examiner is respectfully requested to withdraw this rejection.

For the reasons set forth above, the applicants respectfully submits that claims 1, 3, 8, 22, 24, and 26, now pending in this application, are in condition for allowance over the cited references. Accordingly, the applicants respectfully requests reconsideration and withdrawal of the outstanding rejections and earnestly solicits an indication of allowable subject matter.

This response is considered to be responsive to all points raised in the office action. Should the examiner have any remaining questions or concerns, the examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully submitted,

Dated: August 11, 2010



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